

**REMARKS****Overview**

Claims 7-10, 12, 13, 15, and 17-20 are pending in this application. Claims 7 and 17 have been amended. The present response is an earnest effort to place all claims in proper form for immediate allowance. Reconsideration and passage to issuance is therefore respectfully requested.

**Issues Under 35 U.S.C. § 103**

Claims 7-10, 12-13, 15, and 17-20 have been rejected under 35 U.S.C. § 103 as being obvious over U. S. Patent No. 6,023,217 to Yamada et al in view of U. S. Patent No. 3,474,305 to Szupillo, U. S. Application No. 2001/0017770 to Copetti et al or Sato (61-27264). These rejections are respectfully traversed.

With respect to Yamada, the following observations are made:

- Yamada does not disclose use of tantalum pentoxide (Office Action, page 2, numbered paragraph 2).
- Yamada discloses a protective layer 24 which is "typically epoxy resin" (Col. 3, lines 40-41).
- Yamada discloses printing the protective layer 24 with resin paste (Col. 4, lines 18-22).
- Alternatively, Yamada discloses printing a protective layer 54 with glass paste (Col. 17, lines 65-Col. 8, line 3).

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- Yamada discloses that its cured glass system results in less ion migration therefore improving the moisture resistance life characteristic (See e.g., Table 2, combination 7).

With respect to Szupillo, the following observations are made:

- Szupillo does not use a single metal thin film resistive layer.
- Szupillo discloses use of discontinuous thin film layers connected in parallel.
- Szupillo does not use a continuous metal film resistive layer.
- Szupillo discloses stabilizing each film by preventing agglomeration of the films nucleations by a protective layer dielectric material.
- Szupillo discloses that discontinuous thin films have been obtained through analyzation of continuous thin films wherein portions of material near the surface of the film are oxidized thus forming an electrically insulative barrier layer over the remaining unoxidized portions of the film.
- Szupillo discloses use of tantalum as a discontinuous thin film (Col. 4, lines 36-38).
- Szupillo does not disclose that the second barrier 26 (the outermost layer) is of tantalum pentoxide.
- Szupillo discloses oxidation of tantalum film to provide a discontinuous tantalum film with a tantalum oxide (Col. 8, lines 5-39; claim 13).

With respect to Copetti, the following observations are made:

- Copetti discloses use of dielectrics, including tantalum pentoxide to separate a first electrically conducting layer and second electrically conducting layer (paragraph [008-0013] and paragraph [0025]).

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- Copetti does not use a single metal thin film resistance layer but has multiple conductive layers.
- Copetti discloses depositing a barrier layer 8 of  $S_3N_4$  over the substrate.
- Copetti does not disclose an outer moisture barrier of tantalum pentoxide.

The following observations of Sato are made:

- Sato is directed towards a thermal head and not a thin film chip resistor (Title).
- Sato discloses sputtering a layer of tantalum pentoxide 6 as an abrasion resistance layer in a thermal head.
- Sato discloses using a tantalum nitride layer.
- After tantalum pentoxide is added in Sato, heat treatment is performed at a temperature equal to or high than a peak temperature generated by the heat generating resistor.
- Tantalum oxide has a property that the melting point is high (i.e., 1870° C).

In the Examiner's combination of Yamada with Sato, the Examiner indicates that "Sato discloses sputtering a tantalum oxide layer for the purpose of providing a protective layer so that it would have been obvious to employ a sputtered layer, to replace a protective layer of Yamada, for protection where the references disclose a protection layer or double protection layer for a resistor." (Office Action, page 2, numbered paragraph 2). The Examiner has failed to create a *prima facie* case of obviousness through a combination of Yamada with Sato because the Examiner does not properly consider the purposes of the protective layer in each case and the differences and the purposes of a protective layer in the context of a thermal head and a protective layer in the context of a thin film chip resistor. The Examiner's consideration of layer

only as "protection" is too general and not specific enough to establish a proper rejection, particularly when the references use protective layers of different materials for different purposes. Therefore, it is respectfully submitted that the Examiner has not made a *prima facie* case of obviousness as the Examiner has not provided a proper motivation or suggestion to combine these references. It is further observed that the Examiner has not specifically cited to either reference for the proposition that a sputtered tantalum oxide layer of a thermal head in Sato should replace a cured epoxy resin or glass protective layer of a chip resistor of Yamada.

With respect to the combination of Copetti and Yamada, the Examiner has failed to establish a *prima facie* case of obviousness. In particular, it is observed that the dielectrics of Yamada are screen printed. It is further observed that although Copetti discloses the use of tantalum pentoxide as a dielectric, Copetti does not disclose the use of tantalum pentoxide as an outer layer let alone an outer moisture barrier. Therefore, it is respectfully submitted that the Examiner has not established a *prima facie* case of obviousness in respect to this combination.

With respect to Szupillo and Yamada, Szupillo is directed towards a resistor with discontinuous thin films. Szupillo further discloses oxidizing tantalum film. Therefore, Szupillo's use of tantalum oxide is for a different purpose than the dielectric of Yamada and is formed in a different manner. Therefore, it is respectfully submitted that the Examiner has not established a *prima facie* case of obviousness and this rejection must be withdrawn as well.

When the prior art cited by the Examiner is considered in its totality, the remoteness of the prior art should be clearly recognized. The Examiner does not rely upon any reference for a thin film chip resistor that uses tantalum pentoxide as a moisture barrier. Instead, the Examiner attempts to rely upon other electronic components that use tantalum pentoxide in a different way for a different purpose. It is further observed that the specification demonstrates surprising

results, which further indicates the nonobviousness of the present invention. If the use of a tantalum pentoxide moisture barrier in a thin film chip resistor was so obvious and produces such good results, why was it not being exploited by others prior to the invention?

Therefore, it is respectfully submitted that all rejections must be withdrawn and the Examiner should find all claims in proper form for immediate allowance. Reconsideration and passage to issuance is therefore respectfully requested.

#### Conclusion

No fees or extensions of time are believed to be due in connection with this amendment; however, consider this a request for any extension inadvertently omitted, and charge any additional fees to Deposit Account No. 26-0084.

Respectfully submitted,

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